Energy, Mines and Resources Canada | Énergie, Mines et Ressources Canada

CANMET

Canada Centre for Mineral and Energy Technology | Centre canadien de la technologie des minéraux et de l'énergie

11TH WORLD MINING CONGRESS, BELGRADE, YUGOSLAVIA, MAY 31-JUNE 3, 1982
9TH INTERNATIONAL EXHIBITION OF MINING & POWER SUPPLY, ZAGREB, YUGOSLAVIA
11TH INTERNATIONAL BUILDING FAIR, ZAGREB, YUGOSLAVIA, JUNE 4-9, 1982

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ELLIOT LAKE LABORATORY

JULY 1982

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MINERALS RESEARCH PROGRAM
MINING RESEARCH LABORATORIES
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MICROMEDIA

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by

M.U. Savich*

ABSTRACT

The topics discussed at this Congress in Belgrade were:

1) Mineral raw materials - a factor of world economy;

2) Techniques, technology and safety in the mining industry.

One hundred papers were presented in six official languages: English, Russian, Spanish, German, French and Serbo-Croatian. The Congress was attended by about 1,700 professionals and guests.

All papers presented are in the libraries of the Elliot Lake Laboratory and CANMET, Ottawa.

The 9th International Mining and Power Supply Fair and the 11th International Building Fair were prepared jointly by the Zagreb Fair. The Yugoslavian and foreign exhibitors were presented with the latest technical advances and novelties.

The traditional event - jump over Leather - was held under the organization of the Mining, Geological and Oil Faculty in Zagreb.

Pre- and post-congress excursions with departure and return from Belgrade and Zagreb were organized by Yugoslavian mining companies.

The next World Mining Congress will be held in India.

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INTRODUCTION

The 11th World Mining Congress was held in Belgrade (Beograd = White City), Yugoslavia from May 31st to June 3rd of this year. The 9th International Mining and Power Supply Fair and the 11th International Building Fair were prepared jointly by Zagreb Fair. Pre- and post-congress excursions were organized by Yugoslavian mining companies.

CONGRESS IN BELGRADE

Venue for the Congress was the impressive Sava Centar. The Congress was attended by 1,718 delegates from 57 countries (Table 1). The papers were presented in the six official languages of the Congress: English, French, Russian, Spanish, German and Serbo-Croatian. One hundred papers from 24 countries were presented (Table 2).

The topics discussed at the Congress were (Appendix A and B):

PLENARY SESSIONS

Main theme: Mineral raw materials - a factor of the world economy.

Theme subdivisions:

1) Availability of mineral raw materials.
2) Exploration and development of new deposits.
3) New developments in mining technology and deep and opencast mines for optimum exploitation.
4) Mine working conditions and environment issues.

ROUND TABLE

Main theme: Techniques, technology and safety in mining industry.

Theme subdivisions:

1) Energy raw materials - present and future problems.
2) Development and use of non-metallic mineral raw materials.

Table 1 - Statistical data on participation in the Congress

PARTICIPATING STATES

		ATTENDANCE			ATTENDANCE			ATTENDANCE
1.	ALGERIA	5	23.	INDIA	16	45.	SUDAN	1
2.	ANGOLA	3	24.	INDONESIA	4	46.	SYRIA	1
3.	ARGENTINA	1	25.	ITALY	16	47.	TANZANIA	3
4.	AUSTRALIA	7	26.	IRAN	1	48.	TUNISIA	5
5.	AUSTRIA	25	27.	JAPAN	7	49.	TURKEY	10
6.	AFGHANISTAN	1	28.	JORDAN	4	50.	UN	1
7.	BELGIUM	3	29.	KOREA	5	51.	UNITED KINGDOM	83
8.	BOLIVIA	2	30.	KUWAIT	2	52.	UGANDA	2
9.	BRASIL	6	31.	LYBIA	9	53.	U.S.A.	30
10.	BULGARIA	18	32.	MADAGASCAR	1	54.	U.S.S.R.	80
11.	CANADA	10	33.	MOROCCO	4	55.	ZAMBIA	3
12.	CHILE	3	34.	MEXICO	9	56.	VENEZUELA	10
13.	CHINA P.R.	16	35.	NETHERLANDS	2	57.	YUGOSLAVIA	923
14.	CZECHOSLOVAKIA	46	36.	NIGER	1		TOTAL ATTENDANCE	1718
15.	EGYPT	6	37.	NORWAY	9		LANGUAGES USED	
16.	FINLAND	11	38.	PERU	10		ENGLISH	284
17.	FRANCE	23	39.	PHILIPPINES	2		FRENCH	56
18.	GERMANY F.R.	131	40.	POLAND	26		RUSSIAN	153
19.	GERMANY D.R.	16	41.	ROMANIA	2		SPANISH	95
20.	GREECE	1	42.	SPAIN	56		GERMAN	204
21.	GUINEA	1	43.	SWEDEN	27		SERBO-CROATIAN	926
22.	HUNGARY	17	44.	SWITZERLAND	1		TOTAL	1718

Table 2 - Papers presented

PAPERS PRESENTED

#	COUNTRY	PLENARY SESSIONS	ROUND TABLE	Σ
1	Austria	2	0	2
2	Bulgaria	2	2	4
3	Canada	0	1	1
4	China	4	2	6
5	Czechoslovakia	2	2	4
6	Finland	2	1	3
7	France	2	2	4
8	GDR	3	2	5
9	GFR	5	0	5
10	Hungary	2	0	2
11	India	3	0	3
12	Italy	2	4	6
13	Japan	2	0	2
14	Korea	0	1	1
15	Peru	1	0	1
16	Poland	3	1	4
17	Romania	2	1	3
18	Spain	2	1	3
19	Sweden	2	2	4
20	Turkey	2	1	3
21	U.K.	5	2	7
22	U.S.A.	4	0	4
23	U.S.S.R.	5	8	13
24	Yugoslavia	6	4	10
Total Papers:		63	37	100

3) Metallic mineral raw materials.

4) Development and scientific research work in mining industry.

5) Safety at work in mines.

All papers presented are in the libraries of the Elliot Lake Laboratory and CANMET, Ottawa.

The official closing of the Congress was on June 3rd in the Plenary hall of the Sava Centre and all participants were transferred from Belgrade to Zagreb.

9TH INTERNATIONAL MINING AND POWER SUPPLY FAIR AND 11TH INTERNATIONAL BUILDING FAIR IN ZAGREB

The 9th International Mining and Power Supply Fair and the 11th International Building Fair were prepared jointly by the Zagreb Fair and the following institutions: the Economic Chamber of Yugoslavia, the Yugoslav Committee for Organization of the 11th World Mining Congress, Union of the Mining, Geological and Metallurgical Engineers and Technicians of Yugoslavia, Republican Chambers of Commerce, business associations, scientific and professional institutions and the associations of associated labour. Due to this fact the export possibilities of the Yugoslav exhibitors are very big. In addition to exporting products and services the Yugoslav businessmen are interested in various forms of cooperation, extension of the so far existing cooperation and the appearances at the new markets of the West and East countries and of the developing ones.

The following countries appeared at the events: Austria, Belgium, Canada, Czechoslovakia, Denmark, Cerman Democratic Republic, Federal Republic of Germany, Finland, France, Great Britain, Holland, Hungary, Italy, Japan, Lichtenstein, Poland, Switzerland, Sweden and the U.S.A.

9TH INTERNATIONAL MINING AND POWER SUPPLY FAIR IN ZAGREB

The mining show has a smaller contingent of overseas mining

manufacturers that have participated in past shows associated with the World Mining Congresses in Düsseldorf and Istambul. A large presence from West European manufacturers is evident from Appendix C together with the manufacturing organizations from Eastern European countries. USSR was absent.

Yugoslavia is an important producer in Europe of many metals and minerals - notably copper (second place), bauxite (first place), antimony (first place), lead-zinc, iron ore, etc. The production of coal in 1981 amounted to 60 million tons, while in 1985 the production is expected to reach 82 million tons, which will require the construction of new capacities of 22 million tons. Out of the planned production for 1985 the production of electrical energy accounts for 78%.

Big results have been attained in the development and application of new technologies in the production of non-metals: asbestos, magnezite, clay, quartz, as well as in the processing of glass, fire-proof materials, manufacture of ceramics and similar.

The exhibition was held in an area of 23,000 sq. m in pavilions and in the open-air space. The exhibition program was:

Minerals, mineral raw material, exploration of mineral raw material, oil industry equipment, gas industry equipment, equipment for open-cast, underground and underwater exploration, transport machines, compressed air equipment and tools, pit supports in mine and tunnels, electrical equipment, ventilators, air-conditioning equipment, ore dressing machines, equipment for drainage and exploration of underground waters, purification systems, labour safety means and environment protection equipment, automation in the mining industry, consulting and engineering in the mining industry, power supply equipment.

A sales exhibition of publications and technical literature were

also organized. Visitors were able to get all necessary information through a computer terminal. A Round Table Conference was held on 7th June at 10 am. The following themes were treated:

a) Innovations in the mining industry and their contribution to labour humanization.

b) Innovations in the mining industry as an element of productivity.

The traditional event - Jump over leather - was held on 5th June under the organization of the Mining, Geological and Oil Faculty in Zagreb (Appendix D).

11TH INTERNATIONAL BUILDING FAIR IN ZAGREB

Taking part in the Building Fair were the prominent domestic manufacturers and those from foreign countries (Appendix E). The accent of the exhibition program was laid on the presentation of the material and equipment being applied in the building industry, and on the possibilities of the Yugoslav building industry in the construction of different projects. The Yugoslav exhibitors of cement, asbestos and cement products, lime, clay products and technical and decorative stones will offer their products of the top quality for the domestic and foreign market.

The building industry of Yugoslavia has large capabilities and possibilities in the construction of projects and in carrying out the works for the foreign market, particularly for the developing and non-developing countries, in building construction (France, Germany (DFR and DDR), Austria, South America, Europe), hydroconstruction (Europe, South America, North America, Asia, Africa), road construction (Asia), assembly works and in various technical services such as designing, engineering and consulting.

The event occupied an area of 50,000 sq. m. The exhibition program was:

a) Standing groups of products:

- rough building works (basic construction),
- final work, installations, equipment,
- prefabricated products and mounting
- outside installations and special equipment.

b) Thematic groups:

- restoration of old buildings,
- building machinery,
- small scale industry

c) Technical services:

- publishing activity, information
- consulting, engineering, scientific and research organizations.

The Yugoslav Building Centre prepared a conference for 8th June on the following theme (author not in attendance): construction on seismic regions connected with the new legal regulations. All information in connection with this event are available from the representatives of the Zagreb Fair and abroad:

Great Britain

ECL (Exhibition Agencies) Ltd.,
11, Manchester Square
London WIM5AB
Telex 24591
Tel: 01-486 1951

U.S.A.

Kallman Associates,
5, Maple Court,
Ridgewood,
New Jersey 07450
Telex 652-7070
Tel: twk 710 730 5380

CONGRESS EXCURSIONS

PRE-CONGRESS EXCURSION

1) The past record of the Trepca Mines has been distinguished by continuous growth. Over the past five decades the operation has substantially increased its output. The Trepca integrated mining-smelting-chemical lead

and zinc works is a composite organization of associated labour including 22 work organizations and employing more than 20,000 workers. The basic activities of the Works include lead and zinc mining, smelting and processing, and chemical product manufacture. Mining activities include the mining of lead and zinc ore, and the production of lead and zinc concentrate. This activity comprises six work organizations with 12 underground mines, 3 open-cast mines and 5 flotation plants.

Trepca mine and flotation plant, Stari Tig (Old Market) has one of the largest lead-zinc ore deposits in the world and currently mines 750,000 tons per annum with an average lead content of 2% and a zinc content of 4%. The currently established geological reserves of lead-zinc ore and associated minerals such as silver, gold, bismuth, cadmium, etc., will support the operation of the Trepca Mine for more than 20 years, although the area's potential is much higher. The mine is mainly outfitted with Swedish equipment, while the new flotation facilities were procured from the Soviet Union and West Germany.

Trepca Mines are one of the important promoters of overall economic development in Kosovo, and one of the largest and most capital-intensive organizations in Yugoslavia.

2) Elektroprivreda Kosova (Integrated Kosovo Coal and Power Production System) is the second largest (after Trepca) organization in the Kosovo, and one of the major Yugoslav organizations. The current and planned operations of the organization are based on substantial mineral wealth, the proved lignite reserves. The lignite reserves amount to about 53% of Yugoslavia's total lignite reserves, and 48% of all coal reserves.

The coal basin consists of two areas:

- the Kosovo part, with reserves of 6.5×10^{12} t
- the Metohija part, with 4×10^{12} t.

Lignite occurring in this basin is of a more recent date, partly ligneous and partly earthy, with a moisture content of about 50% and an ash content of 12-18%. Its minimum heating value is 8150 kJ/kg (7100 kJ/kg in large-scale exploitation because of dirt band). All lignite can be exploited by open-cast operations because of the very favourable stripping ratio (1:1.2).

Intensive development has been focused on increasing the output of coal, power and other products. It includes the following facilities:

- run of mine lignite (two open-cast operations)	10×10^6	tons per annum
- bauxite (from open-cast operation)	0.3×10^6	tons per annum
- thermo-electric power plants (five units)	790	MW
- dried lignite (two stages)	1.4×10^6	tons per annum
- gas	480×10^6	Nm^3/yr
- nitrogen fertilizer (27% KAN)	0.3×10^6	tons per annum
- industrial steam	1.2×10^6	tons per annum

Future development is primarily based on the expansion of existing open-cast operations and the development of new ones, and on the construction of large thermo-electric power plants in their immediate vicinity.

The first stage of the program, to be completed by the end of 1982, will involve the construction of 2x340 MW thermo-electric power plants, and the expansion of the open-cast operation to 7.5 million tons.

Subsequent stages of the program comprise the development of the new 18 million tons per annum in the Kosovo basin, and of the 9 million tons in the Metohija basin, as well as studies for an additional three thermo-electric power plant units (3x600 MW, total 1800 MW).

3) Suva Reka, (Balkan) - Transport - Mining is a specialized plant for the manufacture of technical fabrics, and conveyor and V-belts. A plant for the production of steel carcass dump trucks and conveyor belts is currently

under construction (English Dunlop licence).

Most of the 'Balkan's' conveyor belt line is devoted to mining applications:

- dirt haulage belts - high wear resistant rubber
- coal haulage belts for open-cast operations - normal strength rubber
- underground mine conveyor belts - low-flammability and self-quenching rubber
- belts for the conveyance of large size ore - high strength rubber.

A full range of dump truck tires is to be manufactured under Dunlop licence. The line comprises the following tire designs:

a) belted design tires
b) belted/steel design tires
c) all-steel design tires;
d) diagonal design tires.

"Balkan" supplies the most important element in mining. Technical fabrics are manufactured by the latest technology.

POST-CONGRESS EXCURSION

1) Mine Velenje. In the coal basin 9 km long and up to 2.5 km wide, the lignite seam was formed at a depth ranging from 10 to 430 m, having a thickness of between 20 and 143 m, with an average heating value of 9,750 kJ/kg. The lignite has 43% moisture, 10% ash and up to 1.2% total sulphur content. Production is highly limited by very complex mining-geological conditions. Maintenance of the optimum output rate requires the opening of a new pit by 1995. Extensive work is being carried out on drainage of water-bearing triassic limestone and layers of water-bearing sand in the coal seam hangingwall in order to increase the exploitable coal reserves and extend the mine life.

The mining vertical concentration method has 80 to 140 long faces. The output per man shift is 6.12 t/day. Power generating plant has a capacity of 500 MW. A major part of lignite output is fired in the power generating plant.

2) The Zirovski Vrh uranium ore mine deposit will be used as fuel in Yugoslavia's first nuclear plant at Krsko. The reserves are 15,000 t U_3O_8 with 1.25 kg/t uranium in ore (Pennsylvania type of ore deposit). The mine is outfitted with Swedish (pneumatic) and West German (LHD) equipment, while the new hydrometallurgical plant was made by Fluor Utah, (U.S.A.) with several Yugoslavian innovations. The water used in processing is filtered before reaching the river (Yugoslavian patent). The waste is transferred to a dump 4.5 km away and placed in a valley surrounded by a 70 m high embankment. Annual production is 1,200 to 1,300 t U_3O_8.

APPENDIX A

PROGRAMME OF WORK OF THE CONGRESS - PLENARY SESSIONS

Monday, May 31, 1982

Place: Plenary Hall - SAVA CENTAR
Time: 3 to 6 p.m.

Main theme:
MINERAL RAW MATERIALS - A FACTOR OF THE WORLD ECONOMY

General survey of Congress paper: M.Simonović, Yugoslavia

Theme subdivision I: 3.10 to 4.40 p.m.
AVAILABILITY OF MINERAL RAW MATERIALS

Survey of papers presented within theme subdivision I:
B.Dukić, Yugoslavia

I/1 Ehrenberger V. - Czechoslovakia
THE COAL INDUSTRY AND THE DEVELOPMENT OF CZECHOSLOVAK NATIONAL ECONOMY

I/2 Bachmann H., Kronemann J., Rotter D. Germany D.R.
AVAILABILITY OF MINERAL RAW MATERIALS - CRITERIA AND MEASURES FOR THEIR COMPLEX SECURITY IN THE GERMAN DEMOCRATIC REPUBLIC

I/3 Royle G.A. - England
RECENT DEVELOPMENTS IN RESOURCE-RESERVE CLASSIFICATION

I/4 Fedorchuk P.V. - U.S.S.R.
PROBLEMS OF ECONOMIC GEOLOGY ESTIMATION OF MINING INDUSTRY MINERAL RESOURCES BASE (INCLUDING ENVIRONMENTAL PROBLEMS)

I/5 Enzer H. - U.S.A.
THE MINERALS AVAILABILITY SYSTEM OF THE UNITED STATES BUREAU OF MINES THE EXAMPLE OF COPPER

I/6 Marušić R., Dražić D., Salazić D., Popović D. Yugoslavia
MINERAL PROCESSING IN YUGOSLAVIA

Theme subdivision II: 5 to 6 p.m.
EXPLORATION AND DEVELOPMENT OF NEW DEPOSITS

Survey of papers presented within theme subdivision II:
R.Ahčan, Yugoslavia

II/1 Sterk G. - Austria
SEARCH FOR MINERAL DEPOSITS AND MINING DEVELOPMENT IN AUSTRIA

II/2 Suang Yu Fa - China P.R.
THE EXPLOITATION OF CHINESE ANTIMONY ORE DEPOSITS

II/3 Roof Classification Group - China P.R.
CLASSIFICATION OF ROOFS OVERLYING GENTLY INCLINED COAL SEAMS IN CHINA

II/4 Grundström L. - Finland
DISCOVERY OF THE NICKEL-COPPER DEPOSIT OF LAUKUNKAN-GAS, FINLAND - CASE HISTORY

II/5 Hennies J. - Germany F.R.
THE FUTURE OF THE IRON ORE MINING INDUSTRY

Tuesday, June 1, 1982

Place: Plenary Hall, SAVA CENTAR
Time: 9 to 12.30 a.m. and 3 to 6 p.m.

Theme subdivision II: 9 to 12.30 a.m.

II/6 Hildebrandt R., Voigtsberger R., Wahemann G. Germany D.R.
EXPLORATION AND DEVELOPMENT OF NEW LIGNITE DEPOSITS IN THE GERMAN DEMOCRATIC REPUBLIC

II/7 Solymos A., Solymos M., Szrbényi F. Hungary
INTRODUCTION OF THE MULTI-PRODUCT MINING SYSTEM IN HUNGARY

II/8 Sinha N.A., Prasad N.S. - India
EXTRACTION OF SOME VERY THICK AND GASSY SEAMS UNDER A MAJOR RIVER

II/9 Berry P., Ghiani M., Massacci P., Piga P., Pinzari M. - Italy
PROSPECTS FOR BENEFICIATING THE ELBA IRON DEPOSITS

II/10 Pinedo F.G. - Peru
PLANNING OF MINING DEVELOPMENT IN PERU

II/11 Glanowski M., Ciszak E. - Poland
EXPERIENCE RESULTING FROM MINING PLANNING AND DEVELOPMENT TO THE SCALE OF MINING REGION IN POLAND

II/12 Slowiński Z., Maciejewicz J., Pochcial Z., Sadecki J. - Poland
MINING COPPER ORE DEPOSIT IN THE LEGNICA-GLOGÓW COPPER BASIN (LGOM)

II/13 Pasarin C. - Romania
EXPLOITATION OF THE LIGNITES FROM HILLY REGIONS IN ROMANIA THROUGH OPEN-CUT MINING

II/14 Birtek N. - Turkey
MINE PROJECT APPRAISAL - SOME BASIC ISSUES

II/15 Keirs B. J. - United Kingdom
REJUVENATION OF AN OLD COALFIELD THE BARNSLEY STORY

II/16 Moses K. - United Kingdom
COAL EXPLORATION IN THE UNITED KINGDOM METHODS AND RESULTS OF THE LAST 10 YEARS

II/17 Gulley A.D., Yegulalp T. - U.S.A.
INTERNATIONAL IMPLICATIONS OF THE RESUMPTION OF AMERICAN GOVERNMENT-OWNED COAL LEASING

II/18 Ćosevski G., Dukić B., Velianovski V., Ceraj Z., Ivošević S. - Yugoslavia
PRESENT STATE AND PROSPECTS OF IRON ORES PRODUCTION DEVELOPMENT IN YUGOSLAVIA

II/19 Krešić M., Simonović M., Atovski B. Yugoslavia
DEVELOPMENT OF COAL PRODUCTION AND UTILIZATION IN YUGOSLAVIA

II/20 Prstić K. - Yugoslavia
PAST DEVELOPMENT AND FURTHER PERSPECTIVE OF MINE COPPER PRODUCTION IN SFRJ TO THE YEAR 2000

Tuesday, June 1, 1982

Place: Plenary Hall, SAVA CENTAR
Time: 3 to 6 p.m.

Theme subdivision III: 3 to 6 p.m.

NEW DEVELOPMENTS IN MINING TECHNOLOGY IN DEEP AND OPENCAST MINES FOR OPTIMUM EXPLOITATION

Survey of papers presented within theme subdivision III:
B.Genčić, Yugoslavia

III/1 Lechner M.E. - Austria
CONTRIBUTION TO THE OPTIMUM DESIGN OF BENCH HEIGHT FOR HARD ROCK OPEN PIT MINING

III/2 Borisov D., Kolev K., Dimirov K., Genadiev Iv. - Bulgaria
THE RECONSTRUCTION, MODERNIZATION AND UNIFICATION OF THE OPEN MINES IN EAST MARITSA LIGNITE FIELD - A CONTRIBUTION TO THE TECHNICALLEVEL ADVANCEMENT AND THE INCREASE OF COAL-MINING EFFECTIVENESS IN THE PEOPLE'S REPUBLIC OF BULGARIA

III/3 Daskalov P., Isaakov S., Stoianov V., Gurkov K., Pehlivanov G. - Bulgaria
IMPROVED TECHNOLOGIES IN THE DEVELOPMENT OF ORE DEPOSITS BY UNDERGROUND AND OPENCAST METHODS IN PR of BULGARIA

III/4 Zouxiang Z. - China P.R.
THE FLEXIBLE SHIELD MINING METHOD WITH AN OBLIQUE FACE

III/5 Heiskanen R., Meriluoto T. - Finland
NEW DEVELOPMENT IN MINE AUTOMATION

III/6 Bieau J. - France
A METHOD OF MINING COAL BY DRAWING IN A STEEP THICK SEAM

III/7 Heim W., Potthoff A., Psota M. - Germany F.R.
MINING ENGINEERING DEVELOPMENTS IN THE POTASH MINES OF THE FEDERAL REPUBLIC OF GERMANY

III/8 Kugler H.U. - Germany F.R.
DEEP-LEVEL WINNING OF RUHR COAL RESERVES

III/9 Stopp H. - Germany F.R.
PROGRESSIVE WINNING TECHNIQUES IN SAAR MINING

III/10 Duchrow G., Fliege H., Schilder C., Dührsen K. - Germany D.R.
METHODICAL AND ENGINEERING SOLUTION FOR THE MINING OF IRREGULAR DEPOSITS

III/11 Mozumdar K.B. - India
SURFACE MINING OF DEVELOPED COAL SEAMS

III/12 Sinha K.D., Kolay M.S.S. - India
OPTIMUM TECHNOLOGY FOR PLANNED EXPLOITATION OF COAL DEPOSITS IN INDIA - COMPREHENSIVE EVALUATION THROUGH O.R. & COMPUTER METHODS

III/13 Kobayashi R., Kubo N., Matsuki K. - Japan
A STUDY ON MAINTAINING THE HAULAGE DRIFTS SUBJECTED TO HEAVY ROCK PRESSURE AT MATSUMINE MINE, JAPAN

III/14 Covaci S., Cozma S. - Romania
THE PERFECTING OF THE SYSTEMS OF EXPLORATION AND OPENING WORK OF THE DEPOSITS ORE EXTREMELY TECTONIZED

III/15 Toron L.C., Rodriguez De L.F. - Spain
NEW TECHNOLOGY FOR PREPARING A NATIONAL COAL INVENTORY

III/16 Almgren G. - Sweden
INTERACTION BETWEEN MECHANIZATION, PRODUCTION VOLUMES AND PRODUCTIVITIES IN UNDERGROUND HARD ROCK MINING

III/17 Karlsson S. - Sweden
COMPUTERIZED PRODUCTION CONTROL AT LKAB'S KIIRUNAVAARA MINE

Wednesday, June 2, 1982

Place: Plenary Hall, SAVA CENTAR
Time: 9 a.m. to 2 p.m.

Theme subdivision III: 9 to 11 a.m.

Presentation of papers - continuation from III/18 to III/24

III/18 Birön C., Arioglu E. - Turkey
DESIGN PRINCIPLES AND SPECIFICATIONS OF THE REINFORCED CONCRETE ARTIFICIAL ROOF FOR THE CAYELI COPPER MINE OF TURKEY

III/19 Bratchenko F.B. - U.S.S.R.
ADVANCING MINING TECHNOLOGY IS THE BASE-LINE FOR THE SOVIET COAL INDUSTRY PROGRESS

III/20 Bronnikov D.M. - U.S.S.R.
NEW DEVELOPMENTS IN THE FIELD OF UNDERGROUND ORE MINING IN THE USSR

III/21 Kolibaba L.V., Gordienko M.N., Kulbida B.P. - U.S.S.R.
EXPERIENCE AND PROSPECTS OF APPLYING CYCLIC-FLOW TECHNOLOGY AT IRON-ORE OPEN-PITS IN THE U.S.S.R.

III/22 Rogich D. - U.S.A.
NEW MINING TECHNOLOGIES RESULTING FROM U.S. BUREAU OF MINES RESEARCH

III/23 Genčić B. - Yugoslavia
SELECTION OF METHODS OF MINING OF URANIUM DEPOSITS IN YUGOSLAVIA

III/24 Lasica M., Lapčević I. - Yugoslavia
THE POSSIBILITIES OF COMBINING OF OPEN-PIT AND UNDERGROUND MINING METHODS IN EXPLOITATION OF VEIN MAGNESITES IN YUGOSLAVIA

Theme subdivision IV: 11.20 a.m. to 2 p.m.

MINE WORKING CONDITIONS AND ENVIRONMENTAL ISSUES

Survey of papers presented within theme subdivision IV:
A. Ćurčić, Yugoslavia

IV/1 Xiao - China P.R.
THE COMBINED VENTILATION SYSTEM AND DUST-PROOF MEASURES IN XIHUASHAN TUNGSTEN MINE

IV/2 Dlouhý J., Michalek J., Suchan L., Botur J. Czechoslovakia
WORKING ENVIRONMENT IN DEEP MINES AND ITS CONTROL

IV/3 Deniau R., Barou S., Leonet O. - France
PREDICTING FALLS OF GROUND AS A MEASURE OF PROTECTION

IV/4 Kadow E. - Germany F.R.
TRAINING IN THE COAL INDUSTRY - AN INVESTMENT FOR THE FUTURE

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12. PRESENT STATE AND THE TRENDS OF DEVELOPMENT IN THE NON-METALLIC MINERAL RAW MATERIAL EXPLOITATION IN YUGOSLAVIA

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15. TECHNICAL - ECONOMIC CONSIDERATIONS OU THE MINING AND CAPITALIZATION OF LOW - GRADE PORPHYRY COPPER DEPOSITS MINABLE BY OPENCASTING

A.Popa, D.Fodor, S.Iuliu ROMANIA

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U S S R

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U.Bajželj, YUGOSLAVIA

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20. ECONOMIC PROBLEMS OF THE PERSPECTIVE DEVELOPMENT OF THE COAL INDUSTRY IN THE PEOPLES'S REPUBLIC OF BULGARIA

V.Zonchev, G.Tuparev, I.Pankova, BULGARIA

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Peng Zhaode, CHINA P.R.

22. COMPUTER-AIDED MINING PROJECTS AND OPERATION FOLLOW-UP

Ph.Jacquin, FRANCE

23. NEW MINING TECHNOLOGY FOR POTSH SEAMS, BY MEANS OF THE LENGTHENED FUNNEL-HOPPER WITH CONTINUOUS LOADING

E.L. Barrera, SPAIN

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A.A. Archer, UNITED KINGDOM

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G.Hayes, UNITED KINGDOM

27. ALL-ROUND EXPLOITATION OF ROCKS IN MINING - THE MAJOR FACTOR OF PROTECTION OF NATURAL RESOURCES AND ENVIRONMENT

V.Rzhevsky, USSR

28. OPTIMAL WAYS OF DEVELOPMENT OF GEOLOGIC PROSPECTING AND INTENSIFICATION OF INDUSTRIAL ADOPRION OF MINERAL DEPOSITS

M.I. Agoshkov, USSR

29. NEW METHODS FOR ESTIMATION OF TECHNICAL AND ECONOMIC STATE OF PROJECTS AT MINING ENTERPRISES

E.V.Petrenko, USSR

30. THE MAIN SCIENTIFIC AND TECHNICAL PROBLEMS OF COMPLEX UTILIZATION OF MINED CHEMICAL ORES DEPOSITS

E.V. Petrocyants, USSR

Theme subdivision V: Safety at Work in Mines

31. INCREASING THE FIREDAMP EXTRACTION RATE WITH HYDRAULIC SLOT CUTTING METHOD

Ha Minje, Tu Higen, CHINA P.R.

32. AIR CONDITIONING OF THE DEVELOPMENT STOPES AT H.D.P.A.

H.Schreiber, FRANCE

33. THE INFLUENCE ON NATURAL AND WORKING ENVIRONMENT IN UNDERGROUND MINING UNDER INCREASINGLY COMPLICATED DEPOSIT CONDITIONS

W.Dietze, H.Meyer, S.Winter, GERMANY, DR

34. TRANSLENT PHENOMENA IN MINE VENTILATION

P.Berry, U.Bilardo, P.Massacci, P.Piga, M.Pinzari, O. Sammarco, ITALY

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A.Frycz, POLAND

36. CUT-AND-FILL MINING METHODS EMPLOYING HARDENING BACKFILL MIHTURES AS AN EFFICIENT MEANS TO IMPROVE THE RECOVERY OF ORES AND PROTECT THE ENVIRONMENT

V.B.Dyakovsky, K.N.Svetlakov
U S S R

37. ABATEMENT OF NOISE AND VIBRATION IN THE CANADIAN MINING INDUSTRY

M. U. Savich, CANADA

APPENDIX C

9th INTERNATIONAL MINING AND POWER SUPPLY FAIR

From Yugoslavia : EXHIBITORS

UNIS BO -AZOT- Gorašde-Vitkovići, BALKANIJA - Beograd, BALKAN -Suve Reke, OOZT DIMČE MIRČEV BUČIM - Radovliš, BRODOMERKUR - Split, BO BETON - Prelog, BILOKALNIK - Drnje, ČESTA - Karlovac, ČESTOGRADNJA- Zagreb, QUARRY of VUDELJA- Lepoglava, COMMERCE - Ljubljana, DRUŠTVO PRIJATELJEV MINERALOG IN FOSILOV- Tržič, DINARA - Beograd, ENERGOINVEST- Tuzla, ELEKTROOPSKRBA - Zagreb, ELEKTROSTOPANSTVO - BO RK BITOLA OOZT Rudnik , SUVODOL - Skopije, ENERGOINVEST - Zagreje ob Savi, ENERGO-INVEST - BO ENERGOKOMERCE - RZZS - Advertising Section - Sarajevo, GEOFIZIKA - Zagreb, FAGRAM - Smederevo, GEOLOŠKI ZAVOD LJUBLJANA- Ljubljana, GEOLOŠKI ZAVOD , Zagreb, GEOZAVOD OOZT TRAVERTIN - Skopje, GEOMAŠINA - Zemun, GEOTEHNIKA - Zagreb, Golubovački Rudnici (Pitnes) - OOUR Očura - Golubovec, GORANSKI RUDNICI NEMETALA, Lokve, GRO GRADITELJ, OOUR GRADJEVINSKA OPERATIVE - Podravska Slatina, DO GRADNJA IGM - Žalec, BO IGM Tounj, INA NAFTAPLIN - Zagreb, INA-PETROKEMIJA - Kutina, INDUSTRIAIMPORT - Zagreb, BO INDUSTROCHEM - Pula, INDUSTROPROJEKT - Zagreb, GRO INDUSTROGRADNJA - Lašče Ličko, INTERPROMET - Beograd, ISIP - Zagreb, BO JADRANKA , OOUR KAMENOLOMI I PUČIŠĆA - Pučišće, BO JEDINSTVO - OOUR JADRAN - Novigrad, JUGOINSPEKT- Zagreb, OOUR Kemija, nafta i gradj. materijal- Zagreb, JUGOMETAL - Beograd, JUGOTEHNA- Beograd, HEK JUGOHROM - Ljeguovec, OOZT STOGOVO - Kičevo, GIRK KALUNI - Drniš, BO KAMEN IGM - Sirač, BO KAMEN IGM - Slavonska Požega, IGM LEPOGLAVA . OOUR KAMENICI LJUBEŠĆICA I KAMENOLOM OČURA- Lepoglava, KEMIJSKA INDUSTRIJA KAMNIK - Kamnik, SOUR REIK KOLUBARA- Lazarevac, BO KOLUBARA - PROMET - Vrsoci , KOMUNALAC , Krapina, SOUR RADE KONČAR - Zagreb, BO RUDAR - Zagreb, OOUR KORDUNSKI RUDNICI NEMETALA - Topusko, IEK KOSTOLAC - OOUR proizvodnja, remont i montaža - Kostolac, KRUŠIK- Valjevo , MAŠINOKOMERC - BO za zastupanje inostranih firmi- Beograd, MERKANTILE - Zagreb, METALKA - Ljubljana, MEKMETAL - Skopje, MEKMETAL-INŽINJERING - Skopje, MEKMETAL - BO RUDNICI I ŽELEZARNICA SKOPJE - Skopje, MEKMETAL , SOZD ZLETOVO - Skopje, Industrija MILOJE ZAKIĆ - Kraljevac, MLADOST - Zagreb, GRO MISKOGRADNJA - Trogrsda, PIK NOVA GRADIŠKA , OOUR za proizvodnju i promet gradj. materijala NADA - Omišani, IKG OSMI SRPANJ - OOUR VAPNARA - Novi Marof , UNIS BO POSJEDA - Gorašde, PROMINS - Zagreb, POSLOVNA ZAJEDNICA ZA PROIZVODNJU I PROMET UGLJE-NOM HRVATSKI , PRVA PETOLJETKA - SOUR Ind. hidraulike i pneumatike- Trstenik, BO PUT , OOUR NISKOGRADNJA - Pula, BO RADLOVAC IGM - Orahovica, GRO RADNIK , OOUR IGM- Benkovac, REMBAS - Resavsko-moravski ugljeni basen - Despotovac, RUDAR - Zagreb, RUDARSKI INSTITUT ZEMUN, Zemun, RUDARSKO - GEOLOŠKO NAFTNI FAKULTET SVEUČILIŠTA - Zagreb, OOUR Viša geološka škola- Varaždin, RUDARSKO-GEOLOŠKO - NAFTNI FAKUL-IST , OOUR Institut za rudarstvo, geotehniku i naftu- Zagreb, RUDEX - Be-ograd, RUDES.- Trbovlje, BO RUDNAP , Organizacija za izvoz-uvoz i unutrašnji promet na veliko- Beograd, SOUR SODASO - Tuzla, BO POLIBOND- Orašje, SLOVENIJA CESTE - TEHNIKA - Ljubljana , TOZD STROJNI INŽENJERING- Ljubljana, ŠUMSKO GOSPODARSTVO - Karlovac, GRO TEMPO , OOUR BETONARA-RAKITJE , Nedjelja, TORANICA , Krivi Palanka, ELEKTROSTROJNA OPREMA - SOUR REK - Titovo Velenje, BO TVORNICA METALNIH PROIZVODA I KONSTRUKCIJA- Ivanić Grad, BO TVORNICA VAPNA I KAMENOG BRAŠNA - Slavonski Brod, Podcrkavlje, UNIKOMERC - Zagreb, UNIS - BO VITEZIT , OOUR HEMIJSKA PROIZ-VODNJA, Vitez, UNIVERZAL - Beograd, KRO VELKOM - Velika Gorica, VELEZIT - OOUR Inozemna zastupstva, sektor gradjevinstva i industrije - Zagreb, VOEST - ALPINE AG- Beograd, BO ZAGORKA , OOUR za proizvodnju vatrostalnih i kiselootpornih proizvoda- Bedekovčina.

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APPENDIX D - JUMP OVER LEATHER

This traditional miners' ceremony, at which young miners enter the mining order, has been celebrated for several centuries.

A young man, who wanted to become a miner, had to go through the period of serving apprenticeship, i.e., of learning to get the qualifications necessary for such a serious, responsible and difficult job. He also had to pass the professional examination to prove his knowledge, and as part of this examination there was his obligation to jump across a mine shaft, whereby he would prove his courage and physical properties, beside professional qualifications also necessary in mining. Succeeding in this he was accepted into the mining branch.

With the development of mining technology, however, shafts were getting wider and it was not possible to jump across them any more. In order to keep this tradition, jumping over a piece of leather was introduced with symbolic significance. One jumps over an apron-shaped piece of leather, which was once girdled at the back as a part of mine working dress. Sitting on this apron the miner got down to his working place gliding through inclined drifts.

Very soon it was obvious that the experience itself was not enough for solving various complex problems met by miners in their practice. Very early schools of mining established, which later grew into high schools of mining and faculties, whose students have taken the jump over leather as a traditional way of entering the miners' order.

This custom has been continued in usage up to today at many schools of mining. After the Second World War successful celebrations in the form of "Jump over the leather" have been held.

Besides being the celebration of introducing freshmen into the mining branch, it is at the same time a festival where graduated students of this

faculty meet after a number of years.

The ceremony consists of two parts:

1) Procession of Freshmen

Some hours before the ceremony is started in the hall, a group of freshmen meet at the faculty. Dressed in traditional mining uniforms with lamps and helmets they go to look for the 'freshmen major' led by their 'noble freshmen'. 'Freshmen major',an experienced and distinguished miner is a person whom freshmen will follow to the place where the 'jump' is going to take place.

Freshmen walk round the town, sing miners' song and look for the 'freshmen major' who is somewhere in the town. When they find him , they humbly ask him to guide them to the place of celebration. At first the 'freshmen major' doesn't want to take them there, afraid of the possibility of spoiling his reputation and fall in estimation and respect from other miners.

However, captured by their song, he agrees to lead them to the celebration asking them for absolute obedience and respect of his personality.

2) The Ceremony in the Hall

While the group of freshmen is still looking for the 'freshman major' another part of the ceremony is going on in the hall. In the hall there are 'old cottages' - old students who have already entered the mining order and engineers and professors too. They sit at 'contrarius tables'on the left and on the right ones, and professors and engineers sit at the 'table of honour' (Fig. D1). With the song "We want a president" they require 'the honourable, famous, distinguished and infallible president' to command the ceremony. 'The honourable president',a person being awarded the absolute

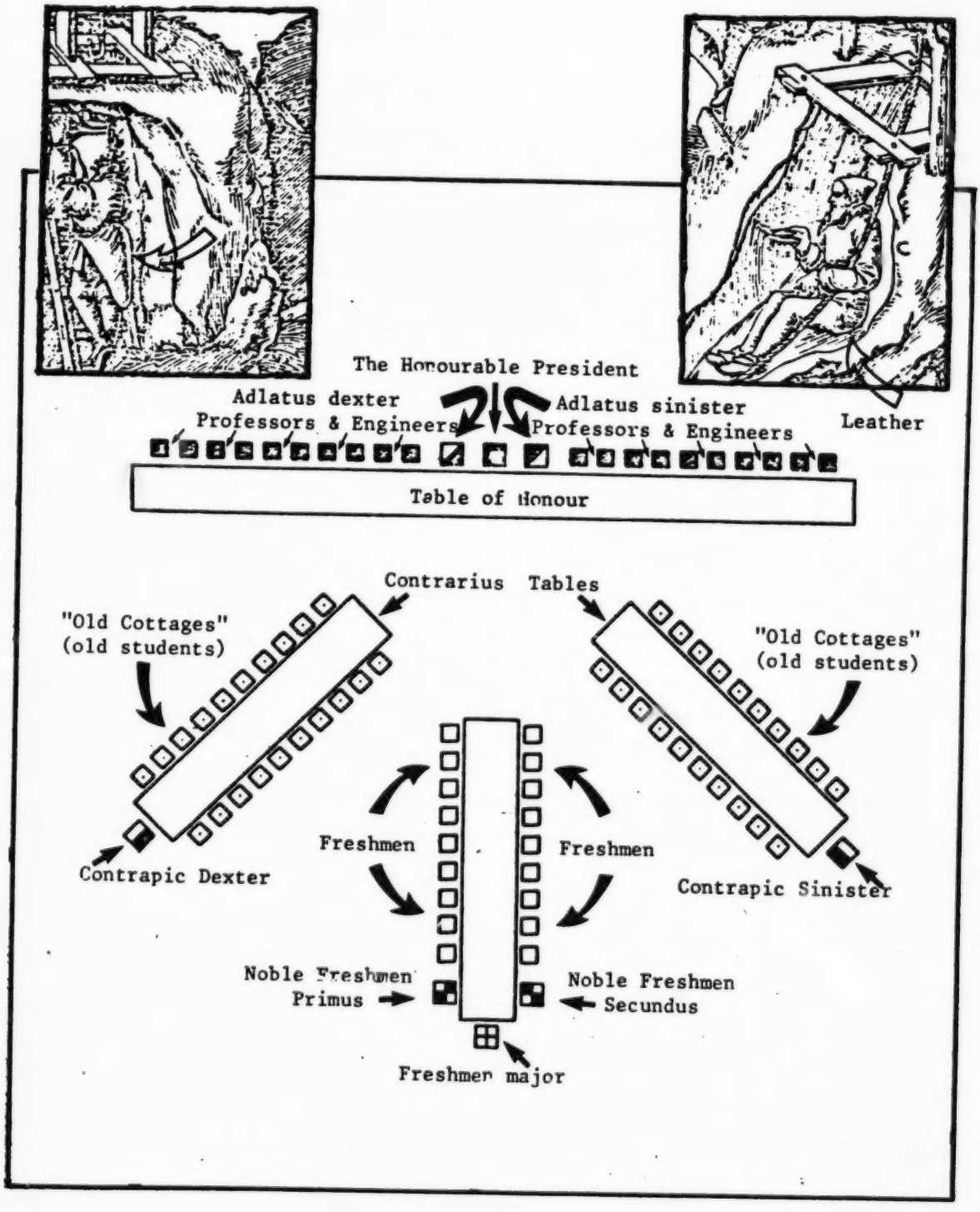

Fig. D1 - The ceremony (celebration).

authority appears, establishing order in the hall and defines other functions of the ceremony: his left and right Adjutants - 'adlatus sinister' and 'adlatus dexter' - and heads of the 'contrarious tables' the 'contrapic sinister' and 'contrapic dexter'. Then the president orders the singing of the international students' hymn "Gaudeamus igitur" and asks the contrapicks to report on condition and behaviour of the 'old cottages'.

After the arrival of the freshmen they sing the mining hymn and then the older students ask freshmen various questions. Once those were serious and professional questions and the candidate had to prove his real knowledge, skills and maturity, necessary for becoming miners. Today these questions and answers are in fact witticisms. 'The president of honour' announces the jump and orders the 'freshmen major', to lead them to jump over the leather. The freshmen are followed by their 'godfathers', older and experienced miners, who belong to the brotherhood of miners.

Before jumping, the freshman has to introduce himself to the gathered audience and to say his slogan, usually a witty thought referring to his future work. After that a young miner jumps from a barrel over the piece of leather held by two distinguished old miners. In this way he symbolically enters the mining fraternity.

With "Habetis res publican",the 'president of honour' announces the ceremony completed.

APPENDIX E

11th INTERNATIONAL BUILDING FAIR

EXHIBITORS

From Yugoslavia :

ADRIAMONG - Rijeka, ALUMINIJ - Komen, AGROTEHNIKA - GRUDA - TOZD AGROTEHNIKA - Trgovina - Ljubljana, SOUR AGROVOJVODINA, RO Unutrašnja trgovina - OOUR Mašinoalat- Novi Sad, BELT - Črnomelj, RO CENTROCOOP Export-import , OOUR OPREMA - Beograd, 24. OKTOBAR- Kruševac, DALIT - Daruvar, DALMASTROJ - OOUR MOK - Split, RO ENERGOMONT - Skopje, ENERGOINVEST - RO TRUDBENIK - Doboj, FAGRAM- Smederevo, RO FERING, OOUR KOMERC-INŽINJERING - Gračanice, GORENJE-PROMET-SERVIS- Titovo Velenje, Gradbeno ind. podj. GRADIS, Ljubjana , GRADJAMONT - Mali Idjoš, Gradjevinski institut - Zagreb, Ro HEROJ SRBA - Smederevo, SOZD IMP - DO IKO - TODZ SKIP- Ljubljana, IMPOL - Slov. Bistrica, Ind. mašina IVO LOLA RIBAR - RO Fabrika mašina i opreme- Železnik, INDUSTROGRADNJA - Zagreb, INTERKOMERC - KONTINENTAL - Beograd i Zagreb, INTERPROMET - Beograd, JELOVICA - Škofja Loka, JINGRAP - PZ jug. proizvodjača za prefab. i ind. gradj. - Beograd, RO KARBON- OOUR KARBON - KOMERC - Zagreb, KARTONAŽNA TOVARNA - Ljubljana, KEMIJSKO GRADJEVINSKA INDUSTRIJA - Karlovac, SGP KONSTRUKTOR n.sol.o. TOZD KOVINAR , Maribor, RO KOOPERATIVA - Garešnica, LIP- Bled, LIPOVICA - Popovača, TVORNICA RADIJATORA , Gradj. Komb. MEDJIMURJE - Čakovec, MERKANTILE - Zagreb, METALNA - Maribor, METALKA - TOZD Zastupstva, Ljubljana, MONTER - Zagreb, NOVOLES - TOZD Blagovni promet, Novo Mesto, POLJOOPSKRBA - Zagreb, POSLOVNA ZAJEDNICA ORGANIZACIJE OPSKRBNE INDUSTRIJE - Zagreb, PROLETER - Sanski Most, PROMINS - Zagreb, SAMO- BORKA - Samobor, SGP Slovenija ceste TOZD Strojni inženiring - Ljubljana, SLOVENIJALES , TOZD PROLES - Ljubljana, SLOVENSKE ŽELEZARNE - Železar- na Jesenice, DIP SPAČVA , OOUR SPAČVA - TRGOVINA , Vinkovci, TEHNO- GRADNJA INTERMONT - Bjelovar, TEHNOSERVIS - Zagreb, TERMIKA - Ljubljana, 3. Maj- Rijeka, TRIMO TREBINJE - Trebinje, SOUR UNIONVEST- RO Unioninvest - plastika , Sarajevo - Semizovac, RO UNIVERZAL- Beograd, RO Univerzal - Vrbovec, VIADUKT - Zagreb, GRO VIADUKT - OOUR Gradjenje- Zagreb, ŽK ZAGORJE , OOUR Završni radovi - Varaždin.

From abroad : A. CORSI - ITALY, AEG - Elektroverkauge Vinnenden- Fed. Rep. of Germany, BARTH - Holland, BRAAS Co. GmbH, Fed. Rep. of Germany, BSP International Foundations Limited - Great Britain, Costruzioni Meccaniche ed idrauliche di BELLOTTO G. & C. snc. Italy, DYNAPAC MASKIN AB- Sweden, EUROTECHNICA - Italy, HILTI AG - Lichtenstein , HOES , West Germany, Information Centre of Building - ETK- Hungary, J.G.B. Switzerland, KABAG- Karshruher Baumaschinen GmbH, Fed. Rep. of Germany, KRINGSVERSAU, Fed. Rep. of Germany, LOKOMO RAUMA REPOLA OY- Finland, MARINI- Italy, NORTON INTERNATIONAL INC. - USA, O & K, Fed. Rep. of Germany, PUTIN - Italy, PEDERSHAAB MASKINFABRIK A/S- Danemark, PEDDIN-HOUSE , Fed. Rep. of Germany, PIAT INTERNATIONAL S.p.A., Italy, RUBERY OWEN THOMSEN EQUIP- MENTLIMITED- England, SCHALUNGSTECHNIK- Austria, SCHELLE- Fed. Rep. of Germany, TREMIX AB- Sweden, TRANSELEKTRO - Hungary, VOLVO BM AB- Sweden, WACKER WERKE GmbH & Co. KG. , Fed. Rep. of Germany.